### OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary
+ see course syllabus available from instructor

<table>
<thead>
<tr>
<th>FACULTY/DEPARTMENT: PHYSICS</th>
<th>PHYSICS</th>
<th>PHYSICS 112</th>
<th>FORMER COURSE NUMBER</th>
<th>ELECTRICITY AND MAGNETISM</th>
<th>UCFV CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE NAME/NUMBER</td>
<td>FORMER COURSE NUMBER</td>
<td>UCFV CREDITS</td>
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<tr>
<td>ELECTRICITY AND MAGNETISM</td>
<td>COURSE DESCRIPTIVE TITLE</td>
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#### CALENDAR DESCRIPTION:

The second half of PHYS 111 is designed for students who are planning to continue their studies in physics or any of the other sciences. Topics include electric fields, Gauss’s law, electric potential circuits, Kirchhoff’s laws, magnetic fields, magnetic induction, and finally, a study of Maxwell’s equations. The laboratory portion of the course uses experiments to reinforce the theory covered in class.

#### PREREQUISITES:

- PHYS 111 or PHYS 101 (B+ or better)

#### COREQUISITES:

- PRE- or COREQUISITE: Mathematics 112

#### SYNONYMOUS COURSE(S)

(a) Replaces: (Course #) for further credit.

(b) Cannot take: (Course #) for further credit.

#### SERVICE COURSE TO:

- (Department/Program)

#### TOTAL HOURS PER TERM:

<table>
<thead>
<tr>
<th>STRUCTURE OF HOURS</th>
<th>TRAINING DAY-BASED INSTRUCTION</th>
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<tbody>
<tr>
<td>105</td>
<td>LENGTH OF COURSE:</td>
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<tr>
<td>Lectures: 60 Hrs</td>
<td>HOURS PER DAY:</td>
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<tr>
<td>Seminar: 0 Hrs</td>
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<tr>
<td>Laboratory: 30 Hrs</td>
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<tr>
<td>Field Experience:</td>
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<tr>
<td>Student Directed Learning: 12 Hrs</td>
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<tr>
<td>Other (Specify): Exams 3 Hrs (done in lab periods)</td>
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#### MAXIMUM ENROLLMENT:

- 35

#### EXPECTED FREQUENCY OF COURSE OFFERINGS:

- WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only) [ ] Yes [ ] No

- WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department) [ ] Yes [ ] No

- TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: [ ] Yes [ ] No

#### AUTHORIZATION SIGNATURES:

- Course Designer(s): George McGuire
- Chairperson: T. Cooper (Curriculum Committee)
- Department Head: T. Cooper
- Dean: K. Wayne Welsh
- PAC Approval in Principle Date: PAC Final Approval Date: December 13, 2000
LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

Students who enroll in this course have completed Physics 111 and Math 111 (Calculus) or their equivalents. The course is intended for students who are planning to study engineering, science, and life sciences. Students will be able to:

1. Understand the fundamental laws of electricity, and magnetism, and learn how to apply the theory to solve related problems.
2. Apply physics to everyday situations and phenomena in engineering, science, and life sciences.
3. Use and investigate modern apparatus, perform fundamental laboratory experiments, and interpret data obtained.
4. Develop a feeling for the order of magnitude of physical quantities in real experiments.
5. Emphasis will be placed on assigning problems which require the student to use calculus in their solutions.

METHODS:

The course will be presented using lectures and laboratory experiments. Films or other audio-visual aids will be used where appropriate. Problems will be assigned on a regular basis which are to be handed in and marked. Problems that require the use of calculus will be emphasized. Close coordination will be maintained between laboratory and classroom work. Computer-assisted learning programs will be used to increase the understanding of the concepts being studied.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:)  □ Yes  □ No

METHODS OF OBTAINING PLAR:

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Extended, John Wiley & Sons, Toronto, 1993

REFERENCES:


SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments  20%
Mid-term  25%
Laboratory Work  15%
Final Exam  40%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

a) Coulomb's Law, electric field, potential, capacitance, Gauss' Law
b) electric current, electromotive force, Ohm's Law, Joule's Law, Kirchhoff's Laws, RC time constant
c) magnetic field, currents, force on a moving charge
d) sources of magnetic field, Ampere's Law, production of B fields, B of long straight wire
e) magnetic induction, induction, induced emf, Faraday's Law, Lenz's Law, mutual inductance, energy in a magnetic field
f) Maxwell's Equations, E and B waves, energy in E/m waves

LABORATORY EXPERIMENTS:

1. DC Circuits
2. Output Impedance of a Signal Generator
3. Cathode-Ray Oscilloscope
4. Self-designed Lab (Measurement of the velocity of sound)
5. Capacitance
7. Mass of an Electron
8. Flux and Flux Density
9. Self-Inductance